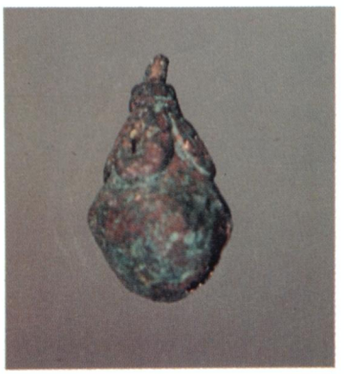
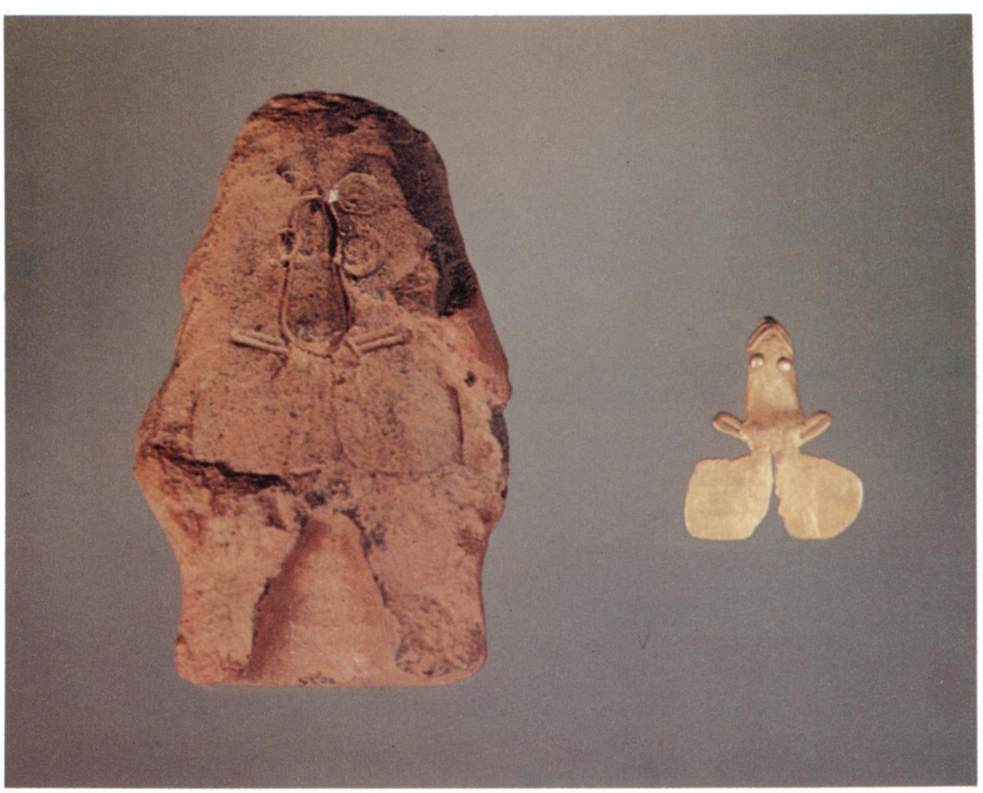
Metallurgy in Costa Rica



Copper bell from a bracelet found on the main burial at Nacascolo. This is the first copper artifact recovered from scientific excavations in northwestern Costa Rica and represents Mesoamerican contacts dating to around A.D. 1200. Length, 2.5 centimeters.

by FREDERICK W. LANGE and RICHARD M. ACCOLA

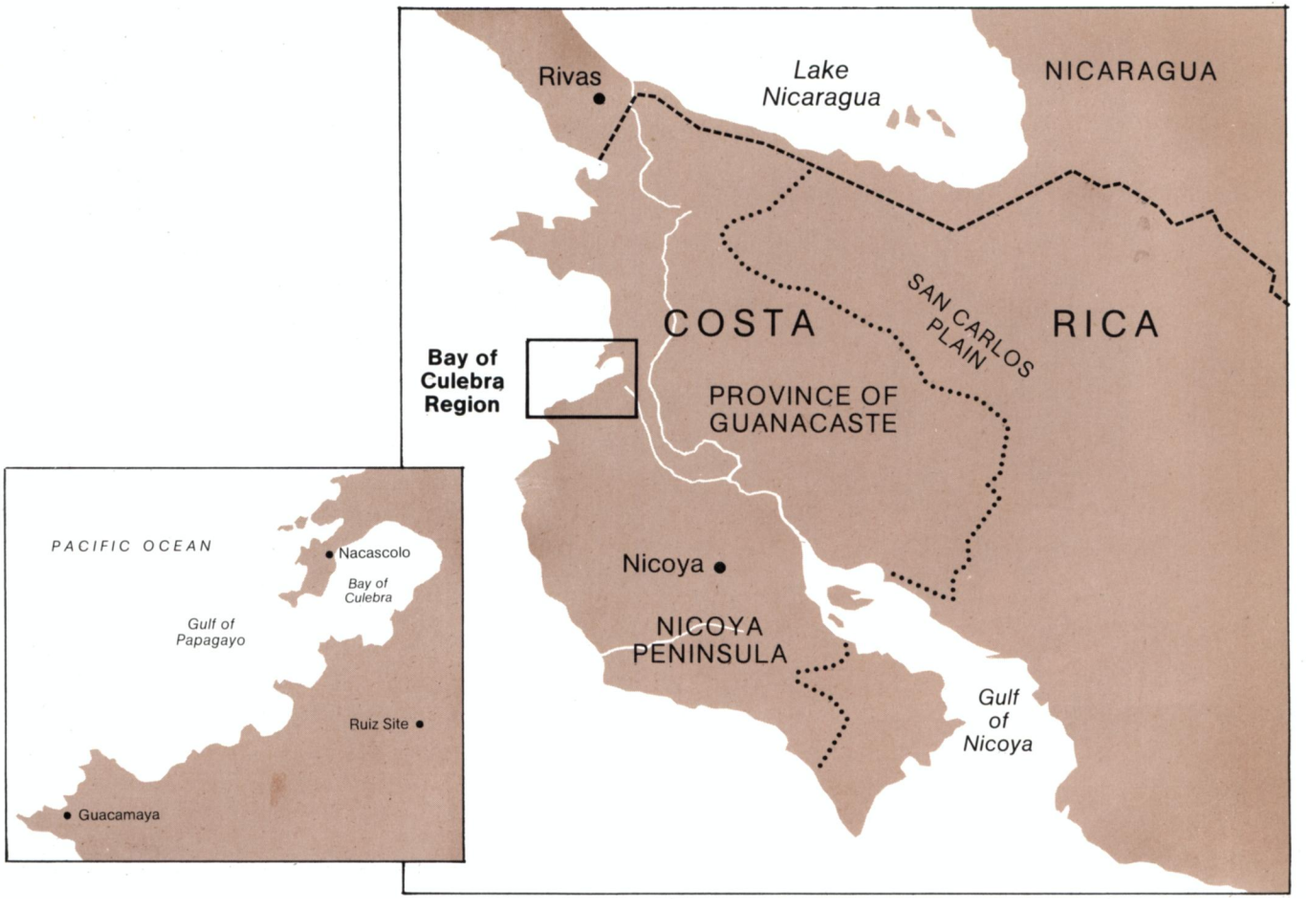
Just where Precolumbian metals originated and how they were distributed between Mesoamerica and South America has long been a subject of considerable controversy. Large quantities of ancient metals are known in Colombia, Ecuador, Panama, Peru and southern Costa Rica, but a curious hiatus seems to have developed in the northern Costa Rica-Nicaragua region. So few metals were found in this area that archaeologists tended to believe that no local metal production existed there at all. Recent discoveries of metal artifacts at three sites in northwestern Costa Rica—Nacascolo, Ruiz and Guacamaya—have triggered serious rethinking of Precolumbian metals and their development. These three sites all lie near the Bay of Culebra on the northwestern Pacific coast, an area which can be considered a "buffer zone" between two major areas of cul-



Lost wax mold fragment from the Ruiz site measuring 6 centimeters in length and the gold frog pendant from Guacamaya, measuring 2.1 centimeters in length. The mold is the first indication of gold metallurgy recovered from northwestern Costa Rica.

Front of a Papagayo/Pataky polychrome vessel with zoomorphic feet from the Nacascolo burial. Height, approximately 25 centimeters.

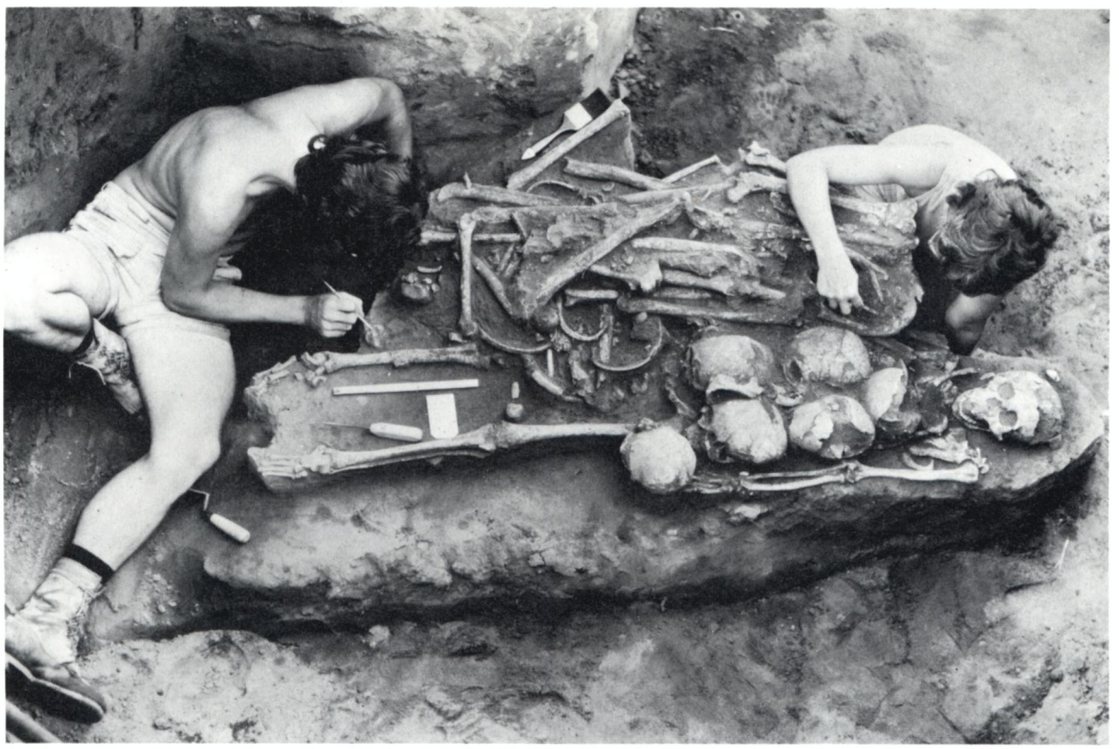
Back of a Papagayo/Pataky polychrome vessel with zoomorphic feet and feathered serpent and jaguar motifs from the Nacascolo burial. Height, approximately 30 centimeters.



tural influence. Scholars have already suggested links between Mesoamerican and South American civilizations using pottery as a primary indicator of internal development and external contact. Now, the small but growing body of metallurgical data provide new dimensions in the study of Precolumbian contact, trade and influence.

Teams of archaeologists have been excavating in the Bay of Culebra region since 1973 under the direction of Frederick W. Lange. Their work has become increasingly vital since more than 60 sites located there are threatened with destruction by a government tourist project. Perhaps the best previously known source of spectacular polychrome ceramics and trade objects is the Nacascolo site, a large shell midden and cemetery complex. After almost a century of uncontrolled looting, an archaeological team under the direction of the authors began excavations at Nacascolo in 1978. Fortunately, the pot hunters have been far less thorough than originally expected. In the flat area at a depth of 1.70 meters below the surface, 11 complete ceramic vessels were discovered associated with burial remains of an adult male, 30 to 35 years old, and a number of male and female skulls. A stone celt or hatchet blade and shell bead bracelets were also found. But unlike grave goods from other burials in the Bay of Culebra, a copper bell was also attached to the bracelet of one of the skeletons. The presence of this metal artifact, after previous discoveries of two gold artifacts reportedly removed from this region by looters, makes this excavated example all the more valuable. By studying the ceramic vessels found with this rare example of ancient metallurgy, it is possible to date the copper bell.

Eight of the 11 burial vessels found at Nacascolo represent the Papagayo/Pataky polychrome type, a ceramic style which derives its vivid red-orange, black and white polychrome colors from the local Nicoya polychrome tradition centered in northwestern Costa Rica. Based on comparative data from various sites, Accola has suggested that the Papagayo/Pataky polychrome type was used specifically for mortuary purposes. The other three ceramic vessels represented one each of three distinctive types: Birmania polychrome, characterized by black and reddish-purple geometric designs over an orangish-cream slip; Mora polychrome with red and black geometric designs and occasional seated human figures on an orangish-cream slip; and Santa Marta poly-



Burial 1 at Nacascolo showing associated skulls lying on the chest of the primary interment.

chrome, also with red and black geometric designs on an orangish-cream slip that is almost always highly polished. This trio forms a ceramic family that clearly constrasts with the red-orange and black over white slip decoration of the Papagayo/Pataky group. While the Papagayo/Pataky group basically reflects communality with the central highland valley of Mexico and the Lake Yajoa region of Honduras, the Birmania-Mora-Santa Marta group shows influence from the Maya lowlands. All four of these ceramic types are well-known in northwestern Costa Rica and date to the end of the Middle Polychrome period (ca. A.D. 1000-1200) in the regional chronological sequence. Similar ceramics from the La Virgen phase in Rivas, Nicaragua date to the same period. Although earlier research at Guanacaste had established Birmania and Santa Marta polychromes as characteristic of the Middle Polychrome period, they had never been excavated in association with the better known Papagayo/Pataky and Mora polychrome types.

The painted motifs on two of the Papagayo/Pataky vessels are similar to designs used in Central Mexican codices—the Precolumbian native folding books in which information was recorded in symbols and pictures. Both vessels are ovoid vases with tripod supports; on each of the vessels, two of the supports are in the shape of zoomorphic feet. Hollow appliqué vulture or hawk heads with round ceramic rattle pellets inside are attached to the front. The painted surfaces depict open jawed serpents with feathers reminiscent of the Nahuatl or Mixtec codices. These motifs contrast greatly with the stylized "kan cross," a design roughly resembling a window with four panes, and polished polychromes of the Mora-Birmania-Santa Marta group which reflect lowland Maya influence. The kind of contacts represented by these two groups of design elements—whether trade relationships or actual migrations—is difficult to determine. Clearly they are important signs of the shift from lowland Maya to highland Central Mexican influence during this period in northwestern Costa Rican prehistory.

The copper bell, however, is one of the most significant grave goods finds at Nacascolo. Like the ceramics, the copper bell serves as an indicator for dating and trade contacts. So far archaeologists have isolated two areas of copper bell production—one lies north of the Maya area in Mexico, while the other is in Honduras. The bell from Nacascolo is tear-shaped; four symmetrical loops circle the shoulder as decoration. Similar bells have been found among the many artifacts recovered from the sacred *cenote* or well at

the lowland Maya site of Chichen Itza in Yucatan and at Zacaleu in the highlands of Guatemala. The Zacaleu example was found in a grave along with a Tohil Plumbate ceramic vessel, dating to the Mesoamerican Early post-Classic period (ca. A.D. 900-1200), a time span which coincides with the Nacascolo burials. Tohil Plumbate vessels, with their highly characteristic brownish gray slips, were traded widely throughout Mesoamerica in post-Classic times. Examples of this type reportedly have been removed by looters at Nacascolo.

Copper bells with the same form as the one discovered at Nacascolo have also been found at the site of Amapa, in Nayarit State on the west coast of Mexico. The presence of this type of copper bell in northwest Costa Rica confirms the generally accepted view of a metallurgical relationship between lower Central America, the southern Maya region and western Mexico. The question still in debate, however, is the direction and process of diffusion of the copper industry. Early scholars attributed a Mexican origin and spread of copperworking, while later ones argue for the introduction of metallurgical techniques in the Maya area from the south, with a possible second center of distribution in western Mexico. Regardless of the direction of flow, the discovery of a copper bell at Nacascolo clearly demonstrates the active interchange of ideas and artifacts between Mesoamerica and the Bay of Culebra region.

The dates of the Nacascolo ceramics and copper bell place the burial at about the time of the Nicarao ethnic group migration into northwestern Costa Rica, at more or less the beginning of the Ethnohistorical or Protohistorical period (ca. A.D. 1200-1500). This was an era characterized by population movements, including immigration by dislocated Mexican groups who were fleeing events farther north; other movements reflect shifts in settlement by the local population. The collapse of lowland Maya civilization some 300 years earlier is reflected in the decline of stylistic influences from that region; an increase in clearly Central Mexican influences such as the motifs and forms of the Papagayo/Pataky polychrome is evident as another cycle of Mexican empire expansion began. The breadth of this interchange can best be seen in the presence of Costa Rican materials at Lake Yajoa in Honduras, Chichen Itza in Yucatan, Chalchuapa in El Salvador, and perhaps as far north as Tula, Mexico. A multitude of ceramic motifs and types reflect conditions of cultural instability. Exotic goods, of which copper artifacts are but one example, also came into the area at this time. Some native copper is present in northwestern Costa Rica, but the quantities are small, suggesting that copper was not exploited by the indigenous peoples. Blades of obsidian, made of a volcanic glass not native to Costa Rica, have also been found among artifacts from this period, while marble vases from the Ulua valley in Honduras and a Teotihuacan tripod from Central Mexico illustrate earlier contact with the Bay of Culebra.

A fragment of a lost wax gold mold discovered at the Ruiz site in 1976 presents perhaps one of the most striking examples of metallurgical contact with the Bay of Culebra during the Protohistoric period. This mold was used to make a frog-shaped gold pendant; it was found in the surface debris of the looted cemetery at Ruiz. Because 93 percent of the ceramics—both those excavated and collected on the surface—date to the Late Polychrome period (A.D. 1200-1520), it is possible to attribute the mold to this same time. Although Warwick Bray of the Institute of Archaeology, University of London, recently reported similar molds in Colombia, gold molds are still quite rare throughout the New World. Their scarcity is a direct result of the lost wax technological process in which the mold must be broken to extract the object once it has been cast.

Ceramics from Ruiz include a high percentage of the Vallejo polychrome type, with its distinctive bluish-gray paint and depictions of Central Mexican deities. This type can be related to the slightly earlier Papagayo/Pataky type found at Ruiz in mortuary contexts as well as at Nacascolo, and affirms a close connection with Central Mexican influences at Ruiz as well. Murrillo Appliqué, another ceramic type found at both Nacascolo and Ruiz, remains an enigma in northwestern Costa Rica, but one with implications for trade patterns. This type is characterized by a polished black slip, globular-shaped jars with restricted openings, and the use of appliqué strips and heads symbolizing mushrooms and aquatic animals. Murrillo Appliqué pottery appears about A.D. 1300 without local prototypes and was obviously already a fully evolved style when it entered the northwestern region. The extensive use of appliqué suggests this type may have been derived from sources to the south or east; its almost exclusive distribution along the coast of the Nicoya Peninsula, islands at the mouth of the Gulf of Nicoya, and major drainages such as the Tempisque River indicate that it may have been introduced or spread by a sea-faring trading group.

In January 1978 excavators from the National Museum of Costa Rica discovered a remarkable coincidence at the site of Guacamaya on the Pacific coast adjacent to the Bay of Culebra. While a gold mold retaining the impression of a frog was found at Ruiz, an actual gold frog pendant

was recovered from a shell midden at Guacamaya. Like the mold, it dates to the Late Polychrome period. The small size and frog shape, as well as the thin construction, are characteristic of most gold pieces reported in Guanacaste. Murrillo Appliqué pottery was also unearthed at Guacamaya. Across the Guanacaste Cordillera on the lowland San Carlos plain, another small gold frog figurine was discovered in 1977 along with a copper artifact in human effigy form; both were found in association with Papagayo/Pataky trade ceramics. The dual appearance of metal objects and trade ceramics again points to the broad expansion of metallurgical and ceramic trade during this period.

The discovery of the copper bell, mold fragment and gold frog pendant in the Bay of Culebra region has had a significant archaeological impact and has stimulated a reexamination of the presence and role of metal objects in Costa Rica. All previous studies of Costa Rican gold and copper artifacts have been limited to stylistic analyses because of the general lack of specimens from excavated contexts. Metals found in the Guanacaste region were practically ignored because archaeologists generally assumed that no finished products were manufactured there, attributing the occasional metal finds to trade. The discovery of a mold, however, is indicative of a metallurgical industry; none are known from commonly designated centers of production in southern and eastern Costa Rica. The mold appears to be made from a locally available Guanacaste clay, but this has not been definitely determined. Because both native gold and copper were readily available in Guanacaste and raw materials could have been imported, it is therefore a strong possibility that metal objects were manufactured in northwestern Costa Rica.

The late Samuel K. Lothrop of the Peabody Museum, Harvard University, noted the surprising paucity of gold artifacts in a region where Spanish explorers reported collecting gold ornaments valued at over 30,000 pesos in A.D. 1522. He suggested that perhaps no local metalworking industry existed and that the great quantities of gold jewelry must have come into the area through trade. The recent discovery of the frog mold in Guanacaste, however, strongly questions the assumption that there were no local centers of metal manufacture. Goldmaking activities were, in fact, frequently described in Conquest period (A.D. 1520-1550) documents from lower Pacific Nicaragua. Nevertheless, the limited number of gold or copper artifacts found in their original contexts presents a substantial hindrance to studies of metallurgical techniques and the cultural role of metal objects among Precolumbian peoples of Costa Rica, particularly the Guanacaste area. But perhaps the current scarcity of gold objects is more a result of the market value of gold rather than a real absence in the region. Because of their small size, gold artifacts are easy to transport and readily stolen by looters. Additionally, their intrinsic metallic value continues to be a stimulus for illegal excavation as long as collectors are willing to pay high prices for them.

Carlos Balser of San José, Costa Rica and the late William C. Root of Bowdoin College, Maine, who have dealt extensively with gold metallurgy in Precolumbian America, consider the typical Central American styles, such as eagle pendants and frogs with large flat hindlegs, to be a relatively late development that peaked just before the Spanish conquest in A.D. 1520. The chronological placement of both the mold fragment and gold frog from Guanacaste, as well as the artifacts from the San Carlos Plain, all tend to support this interpretation. Panama and Costa Rica are generally credited with introducing gold technology to Mexico. In fact, the frog with its rear feet expanded into plaques is so typical of the Costa Rica-Panama area during the Protohistoric period that it acquried the meaning of "gold" in Mixtec codices. A ship sailing from the Azuero Peninsula of Panama or points farther south would probably have stopped in the Gulf of Nicoya or Bay of Culebra enroute to or from Mexico. Even today, ocean currents and Pacific wind patterns offshore northern Costa Rica and southern Nicaragua still make sailing the coast a hazardous venture without access to these refuges.

Unlike Mexico, however, Costa Rican metallurgists apparently made almost no use of silver or copper. When copper was used, it was incorporated with gold into the highly characteristic *tumbaga* mixture. This implies that the Nacascolo bell, the effigy figure from the San Carlos Plain, and other copper artifacts from the area were the products of trade and not local manufacture. This different use of copper in Mesoamerica and lower Central America demonstrates a clear cut distinction between two metallurgical technological traditions. While the copper artifacts represent a technology located to the north, the gold artifacts and technology came from the south. The presence of products of both technologies in the Bay of Culebra area indicates that northwestern Costa Rica represented, for at least part of its prehistory, the northern and southern extensions of these two metallurgical traditions. Until re-

Vallejo polychrome vessel from Ruiz. Blue-gray paint is unique to the Late Polychrome period (A.D. 1200-1520) in northwestern Costa Rica and the decorative motifs depict Central Mexican deities. Height, 14 centimeters.

cently, however, northwestern Costa Rica has been viewed as the frontier between Mesoamerican and South American spheres of cultural influence; it was dubbed the northern sector of a so-called Intermediate Area. As the ceramic and metallurgical artifacts demonstrate, however, Costa Rica is better viewed as a "buffer zone," where cultural traits mingled and were exchanged and adapted. Although the picture is still somewhat complicated, continued archaeological work along the Pacific coast of Costa Rica should someday make it possible to distinguish between locally produced and imported metal artifacts with greater ease. Without additional careful investigation in this area, traces of the development of Precolumbian metallurgy may be lost forever.

FOR FURTHER READING on metallurgy in Precolumbian Mesoamerica: Warwick Bray, "Maya Metalwork and Its External Connections," in Norman Hammond, editor, *Social Process in Maya Prehistory* (Academic Press, New York 1977):365-403, the most up-to-date summary of metallurgical relationships between the Maya area and Lower Central America; David M. Pendergast, "Metal Artifacts in Prehispanic Mesoamerica," *American Antiquity* (1962):520-545, a thorough overview of the distribution of metal artifacts in Mesoamerica; Doris Stone and Carlos Balser, *The Aboriginal Metalwork in the Isthmian Region of Central America* (Editorial Lehman, San José, Costa Rica 1958), a still useful history of metallurgy in the area, techniques of manufacture and stylistic distribution.

On Precolumbian Costa Rica: Luis Ferrere, *Costa Rica Precolombina* (Editorial Costa Rica, San José, Costa Rica 1977), the most current overview of Costa Rican prehistory, including sections on prehistoric metallurgical technology; Frederick W. Lange, "Coastal Settlement in Northwestern Costa Rica," in Stark and Voorhies, editors, *Prehistoric Coastal Adaptations* (Academic Press, New York 1978):104-116, concentrates on the prehistory of northwestern Costa Rica; Doris Stone, *Pre-Columbian Man in Costa Rica* (Peabody Museum Press, Harvard University, Cambridge, Massachusetts 1977), the most current English language analysis of Costa Rican prehistory, profusely illustrated.